

# Future of the teaching workforce symposium

Workshop summary



THE  
ROYAL  
SOCIETY



# Foreword

“This is an important time to consider the future of the teaching profession. Society is changing in ways that are having profound impacts on teaching and learning. In particular, there is a debate to be had over how digital technologies may best be used to enable and enhance learning and help ensure the best possible educational outcomes for young people.”

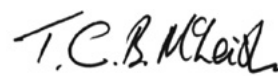
A strong supply of well-qualified teachers is essential for the development of high-performing education systems<sup>1</sup>. On 12 July 2017, the Royal Society convened 50 stakeholders for a *Symposium on the Future of the Teaching Workforce*. This included a workshop, the subject of this report, which used futures techniques to explore what the teaching workforce in England might look like in 2030, and to map out broader changes to the education system.

The point of any futures exercise is to create dialogue, to challenge and develop new perspectives and to connect these back to anticipatory action that may be needed today. This exercise underlined some complex challenges that need to be overcome. For example, the latest data show that there are chronic shortages of teachers in England and that wastage rates among teachers of STEM are among the highest recorded. Such inequalities will almost certainly contribute to disparities in educational outcomes for young people, with potentially serious lifelong consequences.

The rich and diverse discussions centred on such issues as:

- The shortage of teachers;
- The teaching profession and the changing role of teachers;
- The role of technology in education; and
- Broader ‘gateway’ issues including unintended consequences of accountability regimes, funding and inequality of access and opportunity.

I hope you find this discussion summary thought-provoking and compelling.



**Professor Tom McLeish FRS**  
Chair of the Royal Society’s Education Committee

---

1. The Royal Society 2014 Vision for science and mathematics education. See: <https://royalsociety.org/~media/education/policy/vision/reports/vision-full-report-20140625.pdf> [Accessed 5 January 2018].

# Introduction

This report synthesises the output from a workshop as part of the Royal Society’s *Symposium on the Future of the Teaching Workforce*. The event involved 50 contributors from the field of education, including academics, practitioners, policy-makers, and technologists (see appendix 3).

---

## “The purpose of looking at the future is to disturb the present”

Gaston Berger, Futurist

---

The workshop design and delivery was a collaboration between the Royal Society and the School of International Futures (SOIF). The Royal Society is a Fellowship of many of the world’s most eminent scientists and is the oldest scientific academy in continuous existence. SOIF helps policy-makers and business leaders make strategic choices, manage risk and create future-ready organisations.

This workshop took a futures approach to explore what the teaching of science and mathematics might look like in 2030. It was not an effort to predict the future, but a way of coming together to explore possibilities, opportunities and challenges for the sector.

In order to consider the teaching profession in 2030 in a structured way, a number of key drivers of change were identified prior to the workshop that are likely to be important influences on the future of teaching. The drivers were used to devise four cameos for discussion. The cameos provided some examples of possible educational environments in 2030.

The drivers and cameos are introduced in the remainder of this chapter. The following chapters present a summary of discussion topics from the workshop.

## Discussion summary

The following sections of this report provide a synthesis of discussions during the workshop which focused on three stand-out issues.

- **The teaching workforce**

This section summarises discussions around the role of teachers and their training and development. Key challenges were identified around the undersupply of teachers, high wastage rates and the need for an appropriately configured teacher education system.

- **Learning technologies and evidence-based practice**

This section summarises discussions around the need for evidence-based practice and policy in education. Learning technologies, for instance, have great potential, but there is an important need to understand how practitioners can get the most out of them.

- **The education system**

This section summarises discussions around the current education system in England and challenges around access, accountability and funding.

## Drivers of change

Before the workshop, a range of stakeholders helped to develop a number of key drivers of change. Briefly described below are three of the key drivers and their influence on the future of the teaching profession.

The drivers may have considerable impact on teaching, including the technical and interpersonal skills and competences that will be required by its workforce.

The full list can be found in Appendix 1.

- **The changing world of work** – Many existing employers are unclear about the skills their future workforce will need. Technological developments including artificial intelligence, machine learning, robotics, big data and the Internet of Things, are already combining in ways to transform industry and the world of work. Jobs are being created that require new skills and ways of learning.
- **The spread of learning technologies** – The spread of digital technologies and their impact on education have already had an impact on the practice of learning and the role of a teacher. Technology has expanded access to knowledge, collaboration and communication. However, the impact of learning technologies is poorly evidenced and it is hard to determine whether they can improve educational outcomes and what makes for effective pedagogy in the virtual space<sup>2</sup>.
- **The rise of lifelong learning** – Over the last two decades there has been considerable growth in evidence for the benefits of learning, beyond that which occurs during and prior to compulsory or initial education<sup>3</sup>. This is at odds with the current education system which requires students to choose what subjects they would like to specialise in and what career path to pursue at a young age.

## Cameos

To consider the teaching profession of 2030 in a structured way at the workshop, the School of International Futures also devised four cameos or 'scenarios' using the list of drivers of change. Aspects of these cameos exist already within the current education system. The cameos provided a framework for the contributors to discuss current and future aspects of the teaching profession and education system in England.

Details of the four cameos can be found in Appendix 2.

---

2. Oxford University Press's Education Blog has a collection of views from teachers, start-ups, technology providers, and education experts on what can be done to ensure that technology truly improves learning outcomes. See <https://educationblog.oup.com/category/digital-futures> [Accessed 14 December 2017].

3. Schuller, T 2017 What are the wider benefits of learning across the life course? See: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/635837/Skills\\_and\\_lifelong\\_learning\\_-\\_the\\_benefits\\_of\\_adult\\_learning\\_-\\_schuller\\_-\\_final.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/635837/Skills_and_lifelong_learning_-_the_benefits_of_adult_learning_-_schuller_-_final.pdf) [Accessed 5 January 2018].

# The teaching workforce

This section summarises discussions around the role of teachers, including current challenges around shortages, training and development.

## The critical shortage of teachers

Contributors suggested that the ever harder-to-meet challenge of recruiting and retaining teachers can, in the first instance, be addressed in three ways:

1. recruiting and retaining more teachers;
2. requiring fewer teachers;
3. deploying teachers differently.

In a future where the school classroom is the hub of 5 – 19 education, contributors suggested that teacher shortages would be best met by recruiting and retaining more teachers. However, in other scenarios, contributors imagine smaller schools with fewer educators.

## The changing role of teachers

Uncertainties around teacher recruitment are further compounded by the changing and expanding roles of teachers and whether teachers receive the support they need to enter, thrive and remain in the profession. If, as is likely, the long-standing issue of teacher shortages is not addressed successfully, then developments in educational technology may contribute to a push for new roles for teachers.

Those contributors who were considering a future in which traditional classroom teaching remains predominant suggested that teaching will still need to be augmented by subject-specialist input, through specialist teachers and/or specialist learning software.

Conversely, those who were considering a technology-led future perceived a role for teachers as facilitators in their students' learning. This could facilitate out-of-classroom learning and innovative learning approaches (see section 2).



### **Attracting teacher trainees**

Contributors felt that it was government's role to put in place mechanisms to attract and retain teachers through 'professionalising' the teaching profession, for example by reviewing initial teacher education routes, and describing what it means to train as a teacher or as a teacher educator.

There was an understanding that there is no 'magic bullet' to achieve 'professionalisation' and that this will require further discussion. Contributors found it hard to articulate what this means in practice, but there was a feeling that the discourse around attracting and retaining teachers should emphasise words such as 'recognition', 'respect' and 'value.'

Multiple contributors agreed that there should be greater recognition of the time needed to develop necessary teaching skills alongside a clearly defined career development pathway. There was broad support for longer teacher training.

### **Continuous professional development (CPD)**

Contributors suggested that access to high quality CPD will be necessary to ensure teachers maintain their subject knowledge. Some wanted a guarantee from government to increase access to high quality professional development for all teachers. Others noted that high quality provision would demand a greater range of experts, subject-specific support, and more access to development appropriate to the changing educational ecosystem. All recognised that this is difficult due to challenges with workload, access, funding and accountability (see section 3).

### **Teaching the skills needs of tomorrow**

While, at a detailed level, there was uncertainty about the skills of tomorrow, contributors discussed the potential for shift towards more emphasis on meta-learning skills, including problem solving and critical thinking. There was agreement that there is a simultaneous need for generalist teachers and specialists with substantial subject-specific expertise.

Some contributors called for dialogue between schools and industry regarding future skills. It was felt that industry should be involved in shaping education and the curriculum in some way. However, it was unclear how this might be facilitated.

Others suggested that education must continue to have a crucial role in supporting emotional well-being and development in students.

# Learning technologies and evidence-based practice

This section summarises discussions around the need for evidence-based practice in education. Learning technologies, for instance, have great potential, but there is an important need to understand how practitioners can get the most out of them.

## **Can technology enable teachers to focus more on teaching and/or improve pupil outcomes?**

Teachers in particular, saw technology as a way to free them from administrative tasks, such as attendance and emails. Technology was also seen as a significant enabler for the overhaul of assessment, contributing to more continuous assessment of students. It also presents an opportunity for greater innovation.

However, such opportunities come with a price. Contributors emphasised that time and resource will need to be invested so that teachers have confidence and support. Technologist contributors saw the need to build teacher trust and confidence in their products, providing smaller 'stepped' courses which are straightforward to incorporate into lessons. Policy-making contributors emphasised the quality control and regulation of new technology.

Furthermore, an increased reliance on school technology infrastructure risks amplifying the challenges for schools with limited access to support to maintain, use and fund technology equipment and programmes.

While technology could enable more flexible working, it could also lead to an expectation that teachers should be available around the clock.

Technology may also facilitate knowledge exchange and interaction between teachers. For example providing a virtual platform through which teachers could engage with a variety of learning environments, including accessing subject experts.





## Personalised learning

Personalised learning was the opportunity that workshop contributors were most excited about. Increased access to personalised learning for students, combined with an increased diversity of resources for teaching, was discussed positively. Some hoped to see a future where timetables may include virtual classes across schools.

Others expressed concern about the variable quality of learning technologies and emphasised that a shift into the relatively uncharted territory of learning based technologies will require solid pedagogical grounding and quality control. Most were optimistic about the long-term opportunities of technology to enhance learning.

A quick and uncontroversial way to enhance learning would be to use technology to enable access to an otherwise inaccessible people and experiences. More ambitiously, artificial intelligence might help to assess and develop sought-after meta-learning skills such as problem solving and critical thinking.

Ultimately, the idea of 'one-size-fits-all' was unfavourable among contributors, but finding and applying the 'right' size for students was expected to be a significant challenge.

## A shift to virtual learning

There was some agreement that learning could shift into the virtual territory. As such, many of the challenges already met in the former will need to be overcome, such as safeguarding children in new or alternative learning spaces, protecting student data and working out what makes for effective education in the online world.

Social interaction, for dialogue and companionship, will always be an important component of education, despite constraints of the built environment and transport which may dictate access to schools and colleges. Similarly, some subject areas require certain specialist facilities, for example, STEM students have a particular need for creative experimental science in their classrooms or labs.

## Community learning

There was significant discussion around extending the reach of education through wider engagement with local communities. Understandably, there was also concern about how this can be achieved in practice. For example, an increase in learners is likely to require more teachers, but several contributors suggested that this could be addressed by redefining 'who' and 'what' a teacher is.

At a very practical level, schools with wider community links could demand expanded safeguarding and an effective marketplace for matching teachers with learners. There is a need to model the impact of these scenarios to gain an idea of how many teachers would be needed. Others go as far as proposing a discussion about the purpose and philosophy of education.

# The education system

This section summarises discussions around the current education system in England and challenges around access, accountability and funding.

## Access

Unsurprisingly, there was much discussion among contributors around equality of opportunity in the future. A number of dimensions were identified along which the difference between the 'haves' and 'have nots' could be amplified, such as access to reliable technological infrastructure. Many contributors pointed out that as of 2017 there is still no universal access to high-quality Internet, yet there is an assumed requirement for better technology infrastructure and robust connectivity in many imagined futures.

Some contributors foresaw that urban learning environments will have a richer and more diverse set of commercial partners than rural ones, because commercial partners in rural areas may lack the capability or capacity to support local learners in the ways that would benefit both parties.

## Accountability

As important to contributors as their desire for a collaborative, rather than competitive, teaching environment, was their desire for an overhaul of teacher and student assessment; enabled, at least in part, by technology (see section 2). Contributors argued that the focus on league tables within the current education system encourages competition between schools while initiatives that encourage collaboration, such as coaching, peer-to-peer mentoring, communities of practice and specialist skills sharing, are disincentivised.

Several contributors saw the need for a reimagining of the role and purpose of the inspection system, and that this would provide an opportunity for the removal of hyper and/or narrow accountability measures. In turn, this would provide more freedom for teachers to innovate and learn from best practice.

On the other hand, contributors acknowledged that the availability of more assessment data also provides an opportunity for greater scrutiny at a minute level.





## Funding

Given various challenges and opportunities discussed above, it is unsurprising that there is little clarity amongst contributors about how education will be funded in 2030.

Some wondered whether to prioritise the funding of people (such as investment in teacher development) or the funding of new infrastructure (such as ensuring full access to technology). Some policy-making contributors foresaw a nuanced role for traditional funding sources, for example in supporting equity and/or identifying where funding pressures might cause challenges.

# Where do we go from here?

Since the workshop there have been a number of government announcements to support the development of the teaching workforce. The Autumn Budget offered significant funding announcements, including £42 million for a Teacher Development Premium pilot.

Investment in upskilling teachers is welcome news as professional development training is vital to ensure teachers have the confidence and skills to be effective.

However, the symposium identified that it is important to consider some of the gateway issues that are impacting on the teaching profession now. Workshop participants identified a number of key questions that need to be explored further.

- How can a culture that values collaboration more than competition be fostered in education?
- What can be done to foster equality of access and opportunity in a mixed educational ecosystem?
- What needs to be done now to increase the supply of teachers?
- What needs to be done now to ensure a broader diversity of teachers can be met?
- What makes for effective pedagogy in the virtual space?

# Appendix 1: Drivers of change

Before the workshop a number of key issues were identified that are likely to be important influences on the future of teaching. These drivers and trends are listed below.

- Availability of teachers
- School funding
- The rise of smart machines and access to information
- Public perceptions of the teaching workforce
- Access to professional development
- Infrastructure and remote access
- The role of further education
- Experimental learning in schools
- Teacher pupil ratio and teacher contact time
- Teacher training
- Curriculum contextualisation of learning/subjects
- Information sharing (data speed and scale)
- Skills needs and the job market
- Investment in education
- Increasing confidence in using learning technologies in the classroom
- Curriculum change
- Increase in life-long learning

# Appendix 2: Cameos

The drivers of change were used to devise four cameos for discussion at the workshop. The cameos provided some examples of possible educational environments in 2030.

The axes used provide distinction along the lines of space and time. For example, cameos 1 and 2 are more traditional classroom-based models, whereas the learning in cameos 3 and 4 takes place in the virtual environment or across multiple locations.



# Appendix 3: Acknowledgements

## Delegates from the following organisations

4Delta Education  
Apps for Good  
The Association for Science Education  
Bolton School  
The British Educational Suppliers Association  
The Chartered College of Teaching  
City and Islington College  
Department for Education  
Durham University  
Education Policy Institute  
Emerge Education  
Gatsby Foundation  
Gower College Swansea  
House of Commons  
Imperial College London  
The Innovation Unit  
The Institute of Physics  
Loreto Grammar School  
Mayor of London International Business Programme  
Microsoft Education  
National Centre for Excellence in the Teaching of Mathematics  
National Foundation for Educational Research  
Nesta  
Redmoor Academy  
Royal Society of Biology  
Royal Society of Chemistry  
Sheffield Institute of Education  
Silverdale Multi Academy Trust  
Superhuman Ltd  
The Russell Group  
University College London  
University of Cambridge  
University of Manchester  
University of Oxford  
University of Southampton  
University of Southampton  
The Wellcome Trust

## Hosts

Professor Adrian Sutton FRS, Royal Society Education Committee  
Professor Tom McLeish FRS, Royal Society Education Committee

## Panellists

Ian Fordham, Microsoft UK  
Louisa Heinrich, Superhuman Ltd  
Dame Alison Peacock, Royal Society Education Committee

**The Royal Society gratefully acknowledges the work of the School of International Futures in facilitating this workshop.**

## The Royal Society

The Royal Society is a self-governing Fellowship of many of the world's most distinguished scientists drawn from all areas of science, engineering, and medicine. The Society's fundamental purpose, as it has been since its foundation in 1660, is to recognise, promote, and support excellence in science and to encourage the development and use of science for the benefit of humanity.

The Society's strategic priorities emphasise its commitment to the highest quality science, to curiosity-driven research, and to the development and use of science for the benefit of society. These priorities are:

- Promoting excellence in science
- Supporting international collaboration
- Demonstrating the importance of science to everyone

### For further information

The Royal Society  
6 – 9 Carlton House Terrace  
London SW1Y 5AG

**T** +44 20 7451 2500

**W** [royalsociety.org](http://royalsociety.org)



Founded in 1660, the Royal Society is the independent scientific academy of the UK, dedicated to promoting excellence in science

Registered Charity No 207043  
Issued: February 2018 DES5130